Digital Konnekt x32



User's Manual

English Version

IMPORTANT SAFETY INSTRUCTIONS

The lightning flash with an arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

1 Read these instructions.
2 Keep these instructions.
3 Heed all warnings.
4 Follow all instructions.
5 Do not use this apparatus near water.
6 Clean only with dry cloth.
7 Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8 Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9 Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10 Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11 Only use attachments/accessories specified by the manufacturer.
12 Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13 Unplug this apparatus during lightning storms or when unused for long periods of time.
14 Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

Warning!

- To reduce the risk of fire or electrical shock, do not expose this equipment to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the equipment.
- This apparatus must be earthed.
- Use a three wire grounding type line cord like the one supplied with the product.
- Be advised that different operating voltages require the use of different types of line cord and attachment plugs.
- Check the voltage in your area and use the correct type. See table below:

Voltage	Line plug according to standard
110-125V	UL817 and CSA C22.2 no 42.
220-230V	CEE 7 page VII, SR section 107-2-D1/IEC 83 page C4.
240V	BS 1363 of 1984. Specification for 13A fused plugs and switched and unswitched socket outlets.

- This equipment should be installed near the socket outlet and disconnection of the device should be easily accessible.
- To completely disconnect from AC mains, disconnect the power supply cord from the AC receptacle.
- The mains plug of the power supply shall remain readily operable.
- Do not install in a confined space.
- Do not open the unit – risk of electric shock inside.

Caution:

You are cautioned that any change or modifications not expressly approved in this manual could void your authority to operate this equipment.

Service

- There are no user-serviceable parts inside.
- All service must be performed by qualified personnel.

EMC / EMI & CERTIFICATE OF CONFORMITY

EMC/EMI

This equipment has been tested and found to comply with the limits for a Class B Digital device, pursuant to part 15 of the FCC rules.
These limits are designed to provide reasonable protection against harmful interference in residential installations. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on. The user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

For Customers in Canada:

This Class B digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Certificate of Conformity

TC Electronic A/S, Sindalsvej 34, 8240 Risskov, Denmark, hereby declares on own responsibility that the following product:

Digital Konnekt x32

that is covered by this certificate and marked with CE-label conforms with following standards:

EN 60065 (IEC 60065)	Safety requirements for mains operated electronic and related apparatus for household and similar general use
EN 55103-1	Product family standard for audio,video, audio-visual and entertainment lighting control apparatus for professional use. Part 1: Emission.
EN 55103-2	Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 2: Immunity.

With reference to regulations in following directives:
73/23/EEC, 89/336/EEC

Issued in Risskov, June 2007
Mads Peter Lübeck
Chief Executive Officer

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TC NEAR CONTROL PANEL

APPENDIX

Digital Konnekt x32 – Patchbay, Format Converter, Audio Interface and hardware integrator
Digital Konnekt x32 not only puts patching and signal-splitting under preset control, and converts between formats. What comes out is also better than what went in.

Thanks to System 6000 grade clock clean-up and jitter rejection, Digital Konnekt x32 makes your other audio devices and DAW perform better while at the same time facilitating digital interfacing. Digital Konnekt handles AES, ADAT, SPDIF and Firewire audio, and provides extra features such as computer independent operation, convenient monitoring and UI lock.

Clock and jitter reduction
Thanks to System 6000 grade clock clean-up and jitter rejection, Digital Konnekt x32 makes your other audio devices and DAW perform better while at the same time facilitating digital interfacing. Digital Konnekt x32 takes any AES, ADAT, SPDIF or Firewire signal and transforms it into a professional and distributed Reference Clock. A solid clock foundation improves the reliability of digital interfacing as well as the performance of AD and DA converters in your entire studio.

Synchronous routing is 24 bit transparent, even between formats, while sample rate converters may be inserted on inputs that run free or use a different clock reference.

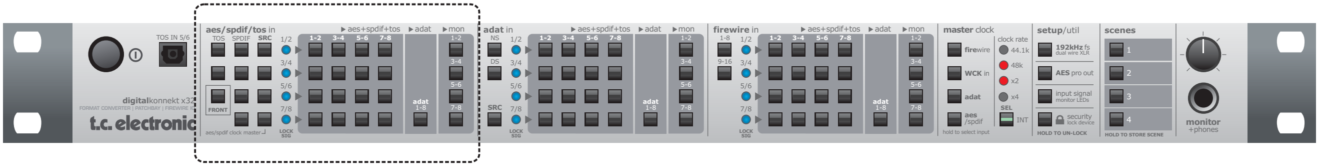
All the Tools – One Toolbox
Up until now, the pro audio market has only seen single function units such as format- and sample rate converters, patchbays, house clocks and audio interfaces offering digital signal handling. Never before have these essential functions been incorporated in a single platform linking your entire fleet of digital devices to your DAW.

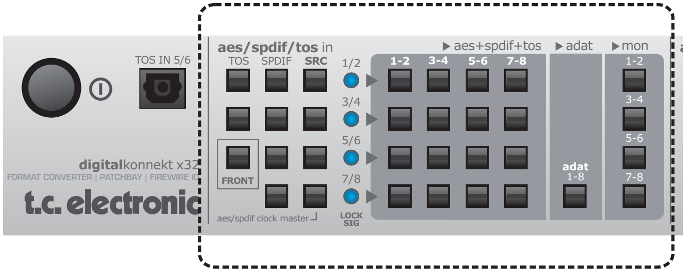
Make your favorite hardware the heart of your DAW
With Digital Konnekt and the new Integrator plug-in, you can now utilize your trusted and favorite digital hardware tools within your DAW system.

Featuring TC's plug-in streaming technology, the Integrator plug-in (VST and AU) facilitates seamless integration of all external units with your recording setup; once connected, adding the unique sound of your Reverb4000 (or any other external digital hardware unit – TC or non-TC) is just a mouse click away. And with the built-in latency roundtrip measuring feature and your DAW's latency compensation, your projects will not suffer from latency induced by external hardware.

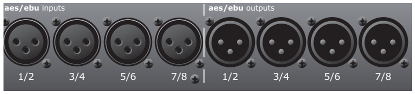
Features
- Flexible digital patchbay
- Format Converter
- 16x16 ch Audio interface
- Seamless DAW integration with Integrator plug-in
- Unique digital matrix style UI for direct selection of signals
- 8 ch of sample rate conversion on board for optimal digital adaptation
- Analog outs (phone and balanced line) for monitoring
- Scene recall enabling instant recall of full setups
- Front panel UI lock to prevent unintended use
- JET™ technology ensures rock solid digital signal handling

Should this manual leave any of your questions unanswered, please use the TC Support service, which you can access via our website www.tcelectronic.com. Over a period of time, we will collect the most frequently asked questions and update the manual accordingly. Manual updates are available for download on our website in PDF format. The current manual revision number is found at the bottom of page 3.





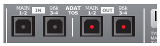
AES



SPDIF



Toslink



POWER switch
Mains power on/off switch.

TOS IN 5/6 - connection
Digital Konnekt x32 handles up to 6 input channels of optical SPDIF via Toslink. Input connections for channels 1/2 and 3/4 are located on the rear panel.
Input connection for channels 5/6 is located on the front.

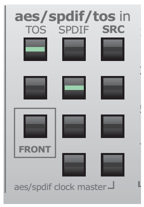
AES/SPDIF/TOS In

This is the input select section for the AES/SPDIF and Toslink inputs on Digital Konnekt x32.
When neither Toslink or S/PDIF inputs are selected (no LEDs are lit), Digital Konnekt x32 defaults to the signal present on the AES inputs.

Selecting channels
For each input channel pair one input type can be selected.

Example 1
In the example below the following is selected:

Input channel pair 1/2: Tos
Input channel pair 3/4: SPDIF
Input channel pair 5/6: AES/EBU
Input channel pair 7/8: AES/EBU

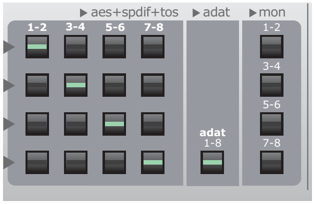


SRC
Digital Konnekt x32 has 4 sample rate converters and thus features individual sample rate conversion on any input channel pair in this section OR on all ADAT channels.

When activating sample rate conversion SRC in the ADAT section, any selected sample rate conversion in the AES/SPDIF/TOS section is deselected.

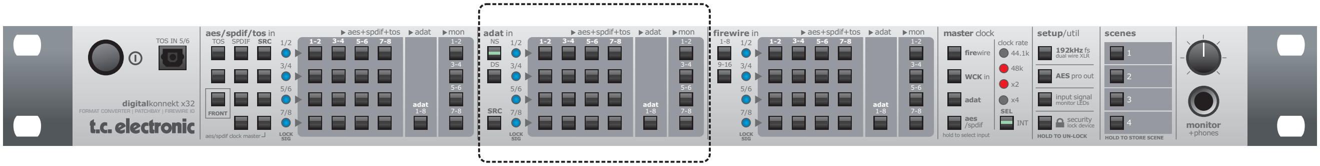
AES+SPDIF+TOS Routing

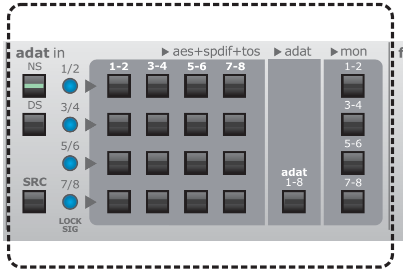
This is the routing section for the AES/SPDIF and Toslink inputs.



Each input channel pair can be routed to any AES/SPDIF/TOS output and to ADAT outputs.

Furthermore any input channel pair can be routed to monitor+headphone out.





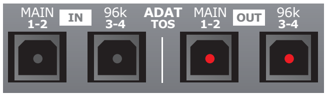
ADAT In

This section routes the signal present on the ADAT in connection. The signal can be routed to AES/EBU, SPDIF, Toslink and ADAT outputs and any pair of channels can also be routed to monitor out.

NS & DS - (Normal and Double Sample Rate)

Using these switches you can alternate between using normal or double sample rate for the ADAT format.

At normal sample rate, 44.1 or 48 kHz, up to eight channels can be sent on a single lightpipe cable. Use MAIN 1-2 connections on the rear panel.



At double sample rate, 88.2 or 96kHz, four channels per lightpipe connection can be sent. To facilitate eight channels, two lightpipe cables for inputs and 2 lightpipe cables for outputs must be used.

ADAT Routing

The four ADAT channel pairs can be routed to any pair of AES+SPDIF+TOS channels and to the eight ADAT channels simultaneously as well.

Example 2

In the example below the following is selected:

Normal sample rate

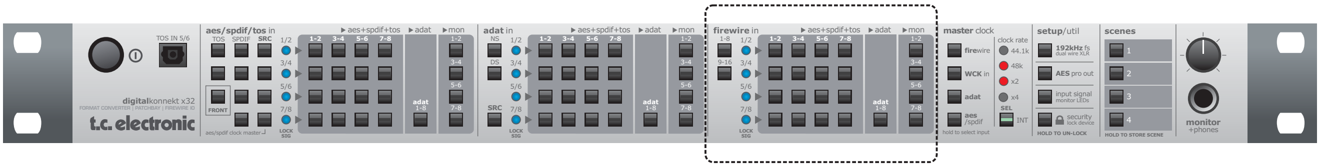
ADAT ch. 1-2 is sent to AES+SPDIF+TOS ch. 1-2
ADAT ch. 3-4 is sent to AES+SPDIF+TOS ch. 3-4
ADAT ch. 5-6 is sent to AES+SPDIF+TOS ch. 5-6
ADAT ch. 7-8 is sent to AES+SPDIF+TOS ch. 7-8

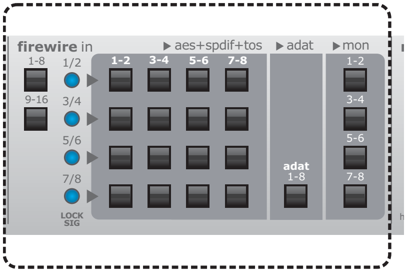
All ADAT channels are sent to ADAT out.
ADAT channels 1-2 are sent to the analog monitor and headphones outputs.



SRC - (Sample Rate Conversion)

Press to activate sample rate conversion on all ADAT input channels. This will deselect any previously selected sample rate conversion.





Firewire In

Up to 16 channels of audio can be received via the firewire connection. This section route these channels. The signal can be routed to, AES/EBU, SPDIF (coax), Tos-link and ADAT outputs. Any channel pair can also be routed to monitor out.

1-8 & 9-16
Select 1-8 to route firewire channels 1-8 and select 9-16 to route channels 9-16.

Firewire Routing

- Firewire channels 1-8 can be routed to AES+SPDIF+TOS outputs or to ADAT out.
- Firewire channels 9-16 can be routed to AES+SPDIF+TOS outputs or to ADAT out.

Note that ADAT channels are handled in groups of eight channels thus either channels 1-8 OR channels 9-16 are routed to ADAT out.

Example 3
A typical setting for this section would be:
- Routing firewire channels 1-8 to AES+SPDIF+TOS 1-8
- Routing firewire channels 9-16 to ADAT.

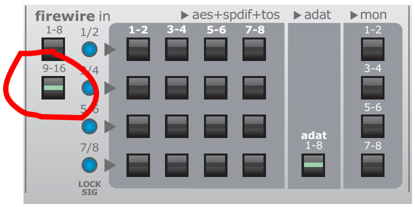
This is set up in the following way:

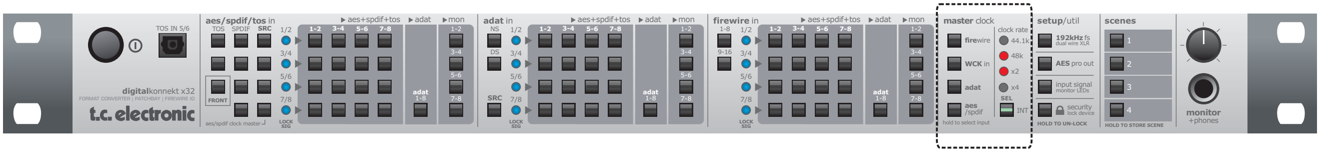
- Press 1-8 to route firewire channels 1-8



We have routed channels 1/2 to monitor out.

- Press 9-16 to route firewire channels 9-16





Master Clock

In any digital system, one, and only one clock can be master. Due to the highly stable clock in the DICEII chip, Digital Konnekt x32 can be used as an excellent master clock. However, due to the DICEII JET™ (Jitter Elimination Technique) and the 4 sample rate converters it may also lock perfectly to external digital devices.

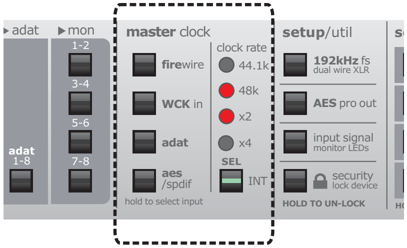
How to set the Master Clock

- Press WCK to lock to wordclock input
- Press ADAT to lock to the ADAT input
- Press AES/SPDIF to lock to a signal present on AES, SPDIF or Tos inputs. AES/SPDIF/TOS inputs are divided into four pairs (Toslink only three pairs), of two channels and you may lock to any of these pairs. To select which channel pair to lock to, follow the procedure described below.
- While holding  press the SRC button in the AES/SPDIF/OPTO section located on the left side of the front panel corresponding to the channel pair you want to use as clock master:



NOTE: You cannot activate SRC on the channel pair you attempt to use as clock master.

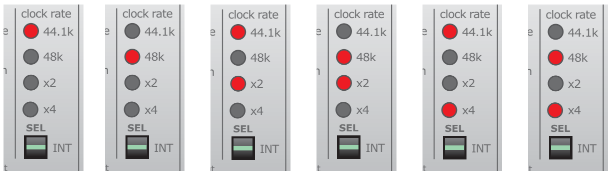
- When connected to a computer via firewire the sample rate is set according to options on the System Settings page in the TC Near control panel.
  For further information please refer to the description of the System Setting page.

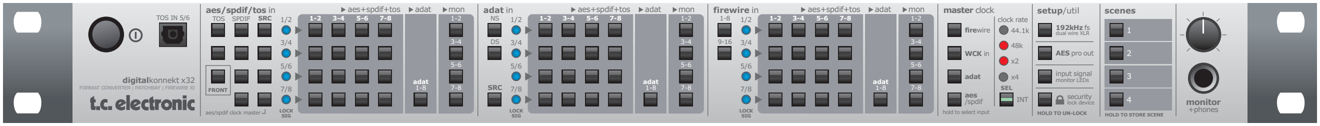


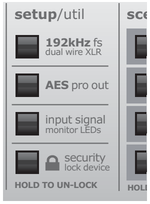
Internal Clock

You may also choose to lock to an internal clock rate. The following rates can be selected by pressing the INT  button.

44.1 kHz	48 kHz	88.2 kHz	96 kHz	176.4 kHz	192 kHz







Setup/Util

Consider this section the master section of the format converter.

192 kHz fs
With this option selected, 4 input channels of AES signal at 192 khz on dual wire XLR can be handled. Channels are distributed as follows:

AES 1/2 : Channel 1 Left
AES 3/4 : Channel 1 Right
AES 5/6 : Channel 2 Left
AES 7/8 : Channel 2 Right

Beware that SPDIF or TOS signals are unavailable in 192 kHz mode!

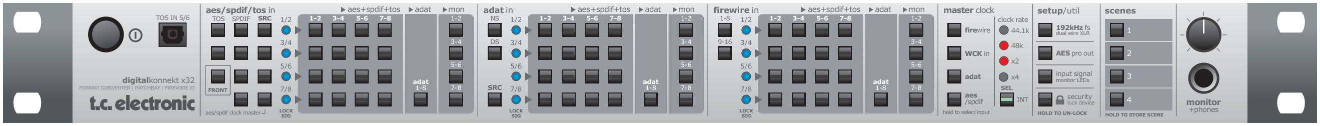
AES - (AES or SPDIF Status bits)
This key allows you to switch between sending AES (professional) or SPDIF (consumer) status bits on AES outputs.

Input Signal Monitor LEDs
The blue LOCK SIG LEDs normally indicate the current lock state for each of the input sections. However, these LEDs can also be used as input meters for these sections. Press to activate.

Security Lock
To avoid unintended operation of the front panel controls, these can be locked.

- Press once to lock
- Press and hold to unlock

Monitor level, and power switch cannot be locked.





Scenes

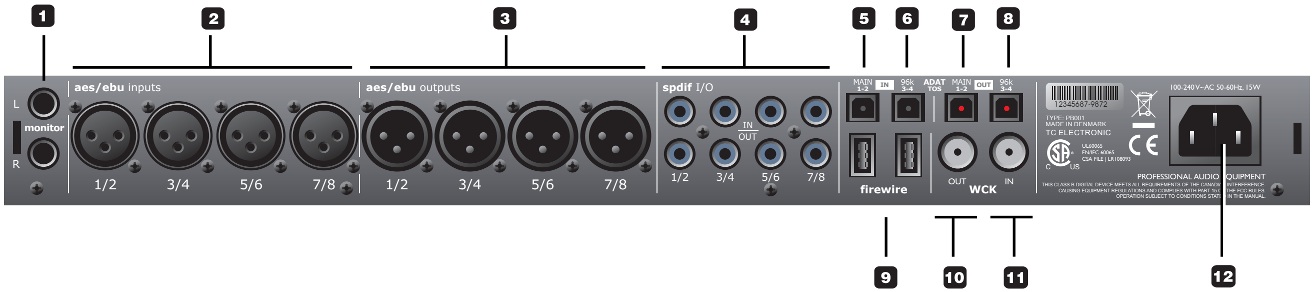
Up to four Scene presets can be stored and recalled via the four scene buttons. A Scene preset stores all current settings except power on/off status and the position of the monitor level knob.

<u>Operation is simple:</u>

- Press and hold to store a Scene preset
- Press to recall a Scene preset

Monitor

The Monitor section provides a 1/4” TRS jack connection for headphones out and a knob for level control. The knob controls both the monitor and headphones level.



1 - Analog Out
Balanced analog outputs on 1/4” TRS jacks. The level of the outputs is controlled by the monitor level control knob on the front panel.

2 - AES/EBU inputs
Female XLR connectors for up to 8 AES channels.

3 - AES/EBU outputs
Male XLR connectors for up to 8 AES channels.

4 - SPDIF I/O
Upper row:
- RCA connectors for 8 input channels of SPDIF

Lower row:
- RCA connectors for 8 output channels of SPDIF

5-8 ADAT/Toslink I/O connectors
The optical connections carry either Toslink (optical SPDIF) or ADAT signal.

ADAT:
- At normal sample rate 8 channels of ADAT is carried on a single lightpipe. Use the MAIN connector.

- At double sample rate 8 channels of ADAT is distributed on 2 lightpipe connectors. Use both the MAIN and the 96 kHz connections.

Toslink:
- Digital Konnekt x32 handles up to 6 input channels and 4 output channels of optical SPDIF via Toslink. Input for Toslink channels 5/6 is located on the front.

9 - Firewire
Firewire connection for connecting Digital Konnekt x32 to a computer and/or linking up to 4 units.

10 - Wordclock Out
Due to the DICE II chip, Digital Konnekt x32 can act as an excellent master clock generator for you setup. Connect via standard BNC plugs.



Beware that the Word Clock signal is not standardized. Some Word Clock receivers are known to fail when the peak-to-peak signal exceeds 3 Volt, and others are known to require at least 4 Volt, making it impossible to design a Word Clock driver guaranteed to operate with all receivers. Digital Konnekt x32 send 1.7V PP.

11 - Wordclock In
Connect your external wordclock generator here and select “WCK in on the front panel.

12 - Power In
The switchmode power-supply accepts from 100 to 240VAC.

INTEGRATOR

The Integrator plug-in for DigitalKonnekt32 makes integration of external hardware into your DAW environment seamless. It offers a “plug-in” audio routing representation of your external digital effects processors and operates as a normal VST/AU plug-in. The Integrator plug-in can be inserted on any track, utilizing external effects as send or insert effects on any track or bus in your host application.



The Integrator plug-in is automatically installed when the TC Near control panel is installed.

Parameters

Lock
Green - indicates correct lock between the selected external digital device and Digital Konnekt x32.

Red - indicates “no lock”. Check connections and settings.

Device
Selects the connected digital devices you are setting up.

1st audio channel
Your DAW detects audio channels on the Digital Konnekt x32 and label these automatically. As the Integrator acts as a stereo plug-in interface between the DAW and external stereo devices, you always select two channel (by default). These are identified by the name of the first channel. In the illustration on the previous page, channel pair 9/10 is selected even though the label says “fw ch 9”.

NOTE: When inserting Integrator on a mono track it still occupies a pair of channels.

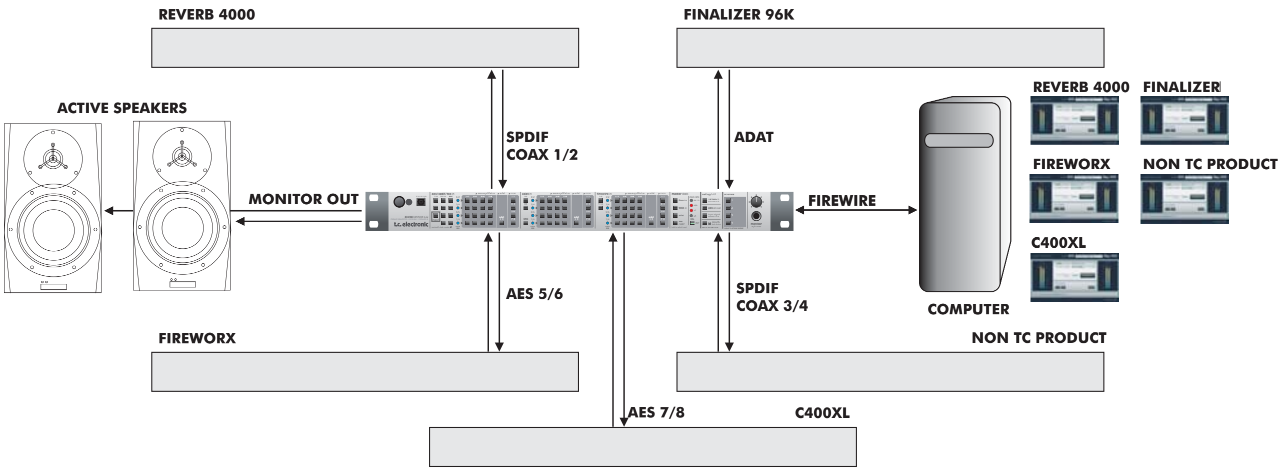
Calibrate
Integrating external digital devices will introduce a short latency. But your host application can be set up to compensate for this using the calibrate function in the Integrator.

- Press CALIBRATE to measure the total roundtrip latency including the latency within the external device.

The latency compensation feature of the host application will then make sure to compensate for this latency.
This procedure should be carried out on each audio track where Integrator is inserted.

SETUP EXAMPLES

Example 1: Integrating external hardware with your DAW



In this example we show how Digital Konnekt x32 and the Integrator plug-in allow integration of external digital effect devices with your DAW via Firewire.

Connections:

- Reverb 4000 is connected via SPDIF coax 1/2 on Digital Konnekt x32
- Finalizer 96K is connected via ADAT I/O
- FireworX is connected via AES 5/6
- The C400XL is connected via AES 7/8
- A non TC Electronic related product with SPDIF option is connected via SPDIF coax 3/4
- Digital Konnekt x32 is connected to your computer via Firewire

NOTE The example above illustrates how several different digital formats can be used at the same time. We could just as well have connected the the Reverb4000 and the Finalizer 96k using AES or SPDIF.

Objects:

- Reverb 4000 is an excellent reverb and we intend to use this as a send effect in our DAW.

- The FireworX has an excellent vocoder preset and we want to use this preset an insert effect on a mono channel.

- Finalizer 96k is a top quality multiband compressor for mastering and we want to use this as an insert effect on a master output bus.

- C400XL is a stereo compressor and should be inserted on a track, a group track or on a bus.

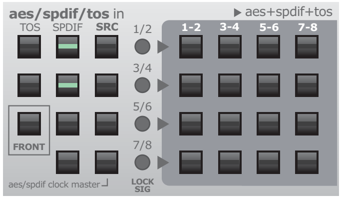
- We leave it up to you to suggest how the “non-TC product” should be used

Please refer to the reference manual for you DAW to learn about setting up insert and send effects.

Setting up Digital Konnekt x32

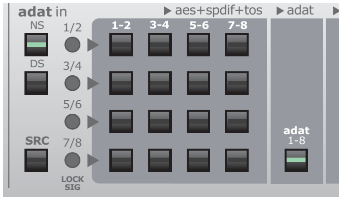
AES/SPDIF/TOS in

- SPDIF is selected for channel pairs 1/2 and 3/4.
- AES is selected for channel pairs 5/6 and 7/8 (no LEDs are lit).



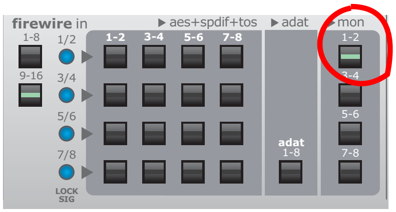
ADAT in

- We select Normal Sample rate and route ADAT channels to ADAT out.



Firewire

- In the Firewire section we choose to monitor channels 9/10.



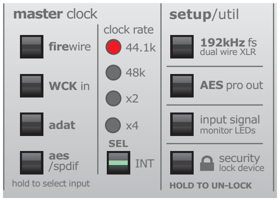
Therefore you must route the main output channels from your DAW to outputs 9/10.

Clock

- In the DAW you select External - as clock source. This allows you to use the Digital Konnekt x32 as master clock.
- Make sure that all external devices are set to lock to external clock
- The “non- TC Electronic” product is set to lock to external clock. - If this is not possible - use the sample rate c*onverter on Digital konnekt x32 for channel 3/4.

* If your external FX has a fixed sample, you have to run your project using that sample rate.

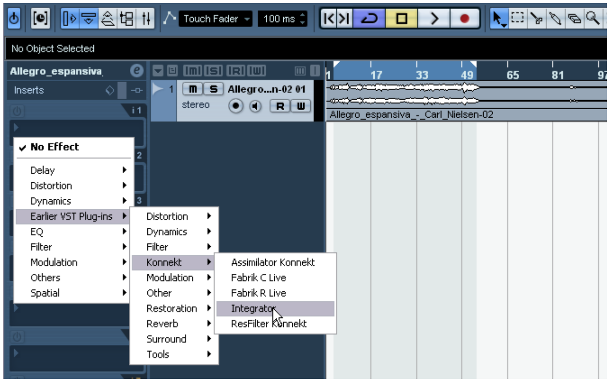
Now the Digital Konnekt x32 operates as a digital patchbay as well as an excellent master clock.



The Integrator

Now that Digital Konnekt x32 is set up it is time to set up your DAW application utilizing the Integrator plug-in.
For each external effect, one instance of the Integrator plug-in must be set up. Each of the Integrator instances then represents one external effect.
This example illustrates how Integrator is inserted in Cubase LE with Integrator set up according to the physical connections as shown in the illustration on page 16.

- This is how you insert the Integrator plug-in.



- The Integrator plug-in now opens.



For each external effects unit you want to integrate you make the same considerations as you are used to when setting up software plug-in effects.

- insert effects are inserted directly on tracks or on a master bus.
- send effects are set up on a fx track

Reverb 4000 - or other Reverbs

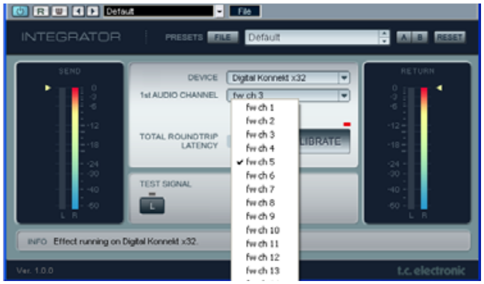
- Insert the Integrator on a stereo track or a stereo bus.



- Select firewire channel 1/2 by selecting “fw ch 1”
  As all channels are handled in pairs, selecting “fw ch 1” is therefore the same as selecting firewire channels 1-2.

FireworX

As described, we want to use the FireworX as an insert effect on a mono track.

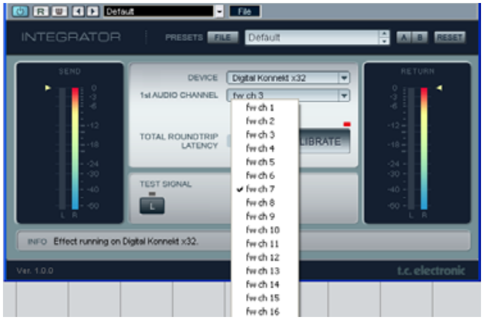


- Select firewire channel 5/6 by selecting “fw ch 5”.

NOTE Integrator always acts as a stereo plug-in, - also when inserted on a mono-track.

C400XL

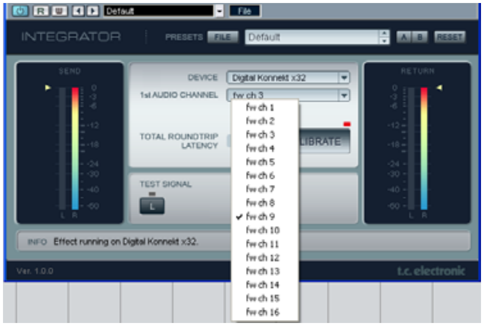
- Insert the Integrator on a stereo track on a stereo bus.



- Select firewire channel 7/8 by selecting "fw ch 7"

Finalizer 96K

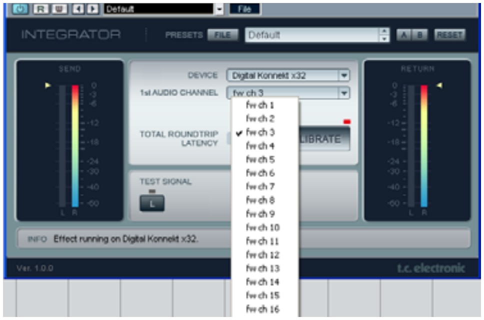
- The Finalizer will typically be used for mastering. Insert Integrator on you master stereo bus.



- Select firewire channel 9/10 by selecting "fw ch 9".

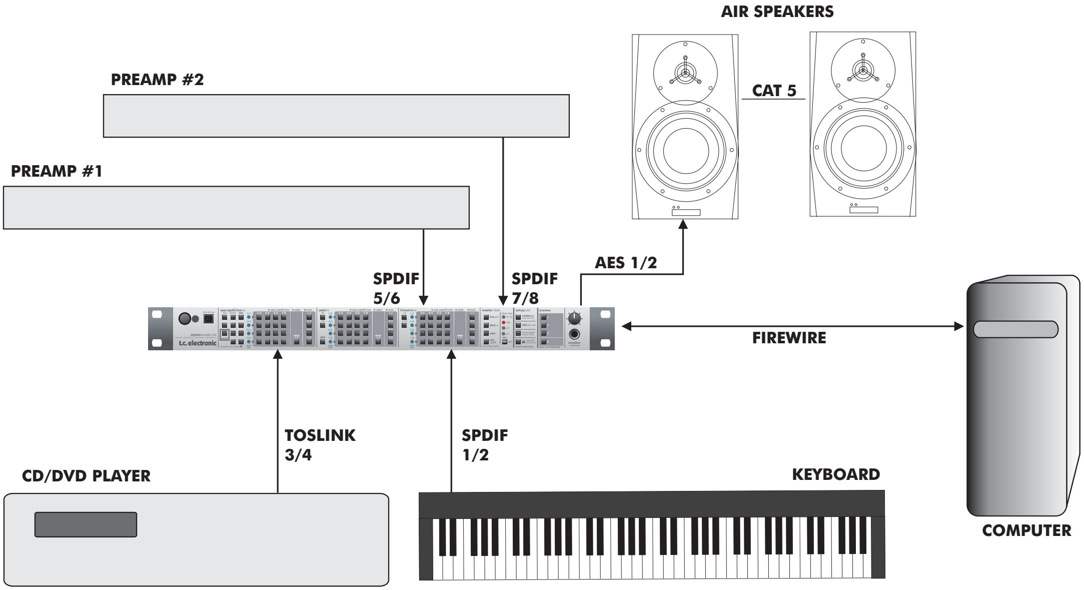
Non-TC Electronic product

- Insert the Integrator on a stereo track or a stereo bus.



- Select firewire channel 3/4 by selecting "fw ch 3"

Example 2: Conventional audio interface



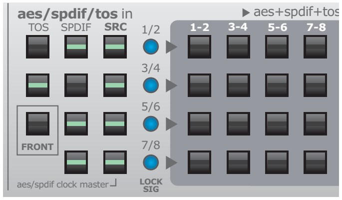
In this example we show how to use the Digital Konnekt x32 as a conventional audio interface with four different external digital sources are connected. For monitoring we have connected a couple of active monitors equipped with AES/EBU input.

Connections

- A keyboard or another digital instrument with SPDIF out is connected to SPDIF 1/2 inputs on Digital Konnekt x32 using a coax cable.
- A CD player with Toslink output is connected to TOS 3/4 inputs on Digital Konnekt x32 using a lightpipe cable.
- Two preamps with SPDIF outputs are connected to the SPDIF inputs 5/6 and 7/8 on Digital Konnekt x32 using coax cable.
- Digital Konnekt x32 is connected to the computer via firewire.
- The master Air monitor is fed from Digital Konnekt x32's AES 1/2 outputs. The Air slave monitor is connected to the Air master monitor via a standard CAT-5 cable.

Setting up Digital Konnekt x32

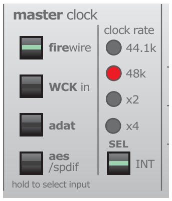
AES/SPDIF/TOS in



- SPDIF is selected for channel pair 1/2. (keyboard)
- TOS is selected for channel pair 3/4 (CD player)
- SPDIF is selected for channel pairs 5/6 and 7/8 (preamp #1 and preamp #2)
- As none of the attached devices can sync to an external clock we activate SRC (Sample Rate Conversion) for all channel pairs.

Master Clock

- We want Digital Konnekt x32 to act as master clock and master clock is therefore set to Internal.
- The actual clock-rate is set on your DAW

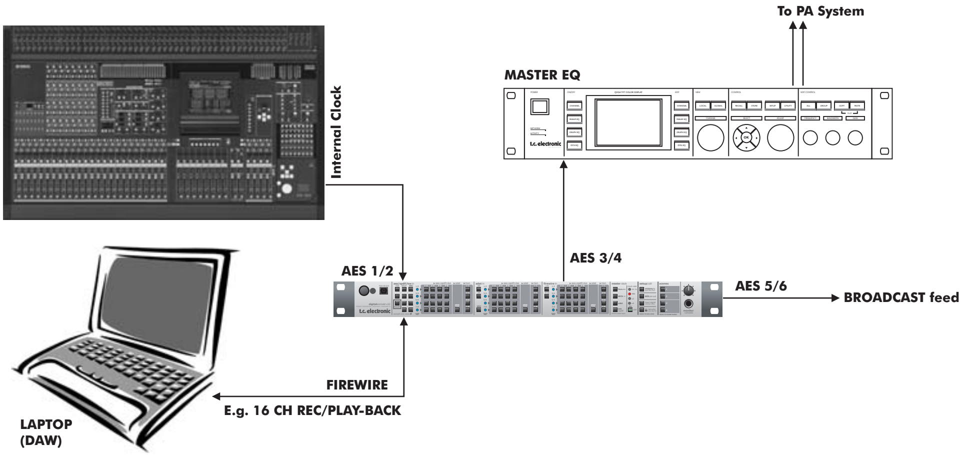


Firewire

- Because the AIR speakers in this example are attached to AES outputs 1+2, we want to monitor the DAW using AES output channels 1/2.
- Via your host program you must send your main outputs Digital Konnekt x32, select AES 1/2 on the front panel and activate AES 1/2 in the Firewire monitor section.



Example 3: PA setup



In this example Digital Konnekt x32 is used in a live situation as a digital splitter box that routes the signal to both a laptop computer for recording/play-back, to the PA system via a master EQ and to a broadcast station.

Connections

- The main output channels of the digital mixing console is fed via AES to the AES 1/2 inputs on Digital Konnekt x32
- AES 3/4 from Digital Konnekt x32 is routed to the PA
- AES 5/6 feeds a broadcast station
- A laptop computer is connected via Firewire for recording purposes.

In this setup the sample rate is set by the DAW running on your laptop, but the mixer is set to act as master clock.

Mixer
In this setup where the mixer acts as master clock, make sure to set the mixer's clock to internal. As Digital Konnekt x32 has excellent sample rate converters via the DICEII chip you should not hesitate to use the SRC function.

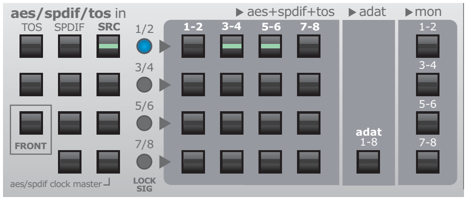
Master EQ
The master EQ is fed via AES 3/4 from Digital Konnekt x32. The EQ must be set to external sync.

Broadcast feed
Via AES 5/6 we send the signal to a broadcast section.

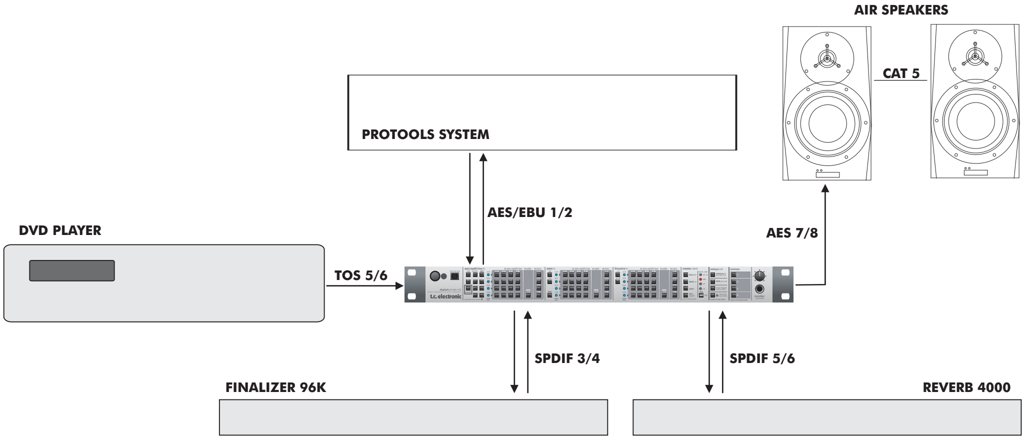
Setting up Digital Konnekt x32

AES/SPDIF/TOS in

- AES 1/2 is selected in the AES/SPDIF/TOS section as none of the LEDs are lit. The blue 1/2 LED indicates that a signal is present on AES 1/2
- Sample Rate conversion is activated on channels pair 1/2
- AES channels 1/2 is routed to the master EQ via AES 3/4 out and also via 5/6 to broadcast



Example 4: Digital Konnekt x32 and ProTools



This example illustrates Digital Konnekt x32 used in conjunction with a ProTools setup integrating external digital devices. The screenshot in this example is based on ProTools HD but applies to any version of Pro Tools hardware that has digital in (AES/EBU, SPDIF, ADAT, TOS or Word Clock).

Connections:

- A DVD player is connected to TOS 5/6
- Finalizer 96K is connected via SPDIF coax 3/4
- Reverb 4000 is connected via SPDIF coax 5/6 on Digital Konnekt x32
- AES 7/8 out is connected to active monitors
- AES 1/2 in/out is connected to ProTools

Objects:

- Reverb 4000 is an excellent reverb and we will use this as a send effect in ProTools.

- Finalizer 96k is a top quality multiband compressor for mastering and we want to use this as an insert effect on a master output bus.

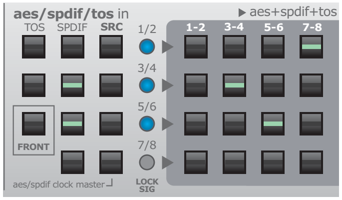
- We want to be able to route stereo audio from the DVD player via TOS to ProTools or directly to the active monitors

As we have five external digital devices and only four channel pairs (not counting ADAT) we have put the DVD player on the same channel pair as the Reverb 4000. In the AES/SPDIF/TOS input select section you will then have to decide which device that should be routed for the current application. - It is likely that you don't need to listen to the DVD player and route the Reverb 4000 at the same time.

Setting up Digital Konnekt x32

AES/SPDIF/TOS in

- SPDIF is selected for channel pair 5/6 (Reverb 4000) - select TOS 5/6 to route the DVD player instead SRC is activated for channel pair 5/6 only when the DVD is used
- SPDIF is selected for channel pair 3/4 (Finalizer 96K
- AES is selected for channel pair 7/8 (no LEDs are lit)

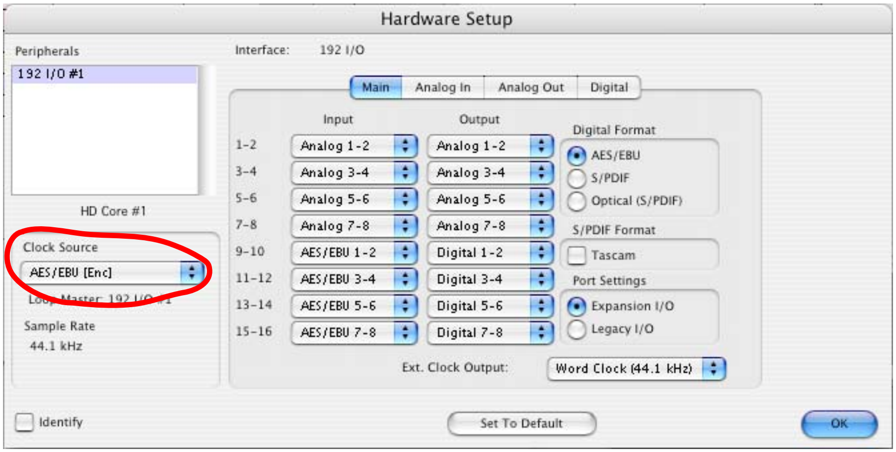


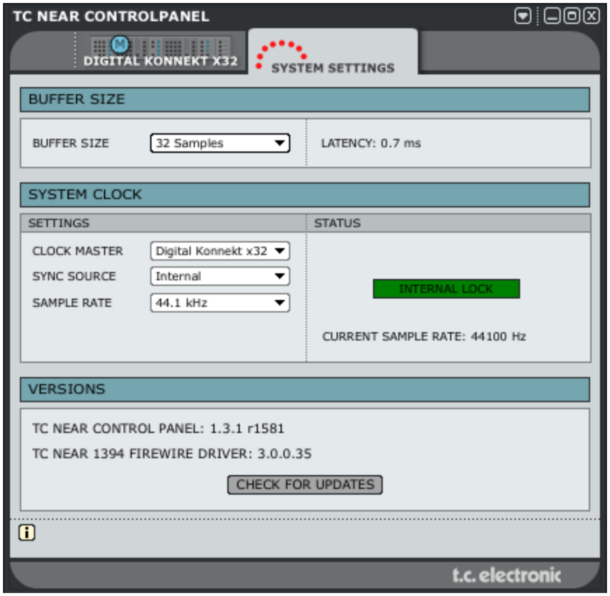
Clock

- In Pro Tools you select AES/EBU - as clock source. Digital Konnekt x32 then acts as master clock.
- The Finalizer 96k is set to lock to SPDIF
- The Reverb 4000 is set to lock to SPDIF
- SRC must be activated for channel pairs 5/6 only when the DVD player is routed.

Protools Hardware Setup page example

Pro Tools is setup to lock to an external source connected to AES/EBU. In this case it locks to Digital Konnekt x32.





Buffer Size

Buffer Size*

The buffer size can be set from 32 to 8192 samples. The higher the buffer setting, the longer latency through Digital Konnekt x32. You should only increase the buffer size if you experience problems such a clicks and pops in the sound. Note that clicks and pops in the sound may also derive from clock problems. These should be resolved first.

* Setting the buffer size via the TC Near control panel is relevant for the PC version only. On Mac computers buffer size is set in the audio application. For instance in Logic Pro go to: Audio/Hardware drivers to set the buffer size.

System Clock

Clock Master

With the Clock Master parameter you select which of the Konnekts in your setup units that should act as system Clock Master.

In a digital setup, it is important that all connected devices run at the same sample rate. The Clock Master device defines this sample rate, and distributes a digital clock based on this sample rate to all devices in the setup. There can be one, and only one clock master in a digital setup, and you cannot select your computer here. However, the Clock Master device may sync to an external device. See “Sync Source” below.

Sync Source

The Sync Source parameter determines to which the device the Clock Master should sync. The DICE II FireWire chip provides excellent clock and in many setups the “internal” option is the best choice. However, you may sync to any digital device attached to the Digital Konnekt x32 digital inputs and enjoy the outstanding JetPLL jitter rejection technology also provided by the DICE II.

Sample Rate

If Sync Source is set to “Internal”, the sample rate must be set. The options are:

44.1 kHz
48 kHz
88.2 kHz
96 kHz
176.4 kHz
192 kHz

The sample rate is typically set by your host application. If you e.g. play a 44.1 kHz project the sample rate automatically shifts to 44.1 kHz. If you later load and play a 48 kHz song, the sample rate shifts to 48 kHz. Though Konnekt receives information about the sample rate it still provides the actual digital clock.

Status

Various lock status indications can be given:

Internal Lock
Indicates that the system is locked to the Digital Konnekt x32 unit set as clock master.

External Lock
Indicates that the system is locked to an external digital device connected to the Digital Konnekt x32 set as clock master.

No Reference
External sync on the Digital Konnekt x32 set as master is unobtainable. Check connections and external device.

Versions

This section gives information on Control panel versions and FireWire driver.

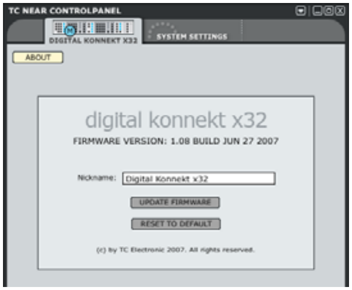
Check for updates

- If the computer is connected to the Internet you may check for updates by pressing “CHECK FOR UPDATES”. You will be directed to the Konnekt product page at www.tcelectronic.com
- Press “Click here to download the latest version” and download the full installer.
- Run the installer.

Updating firmware

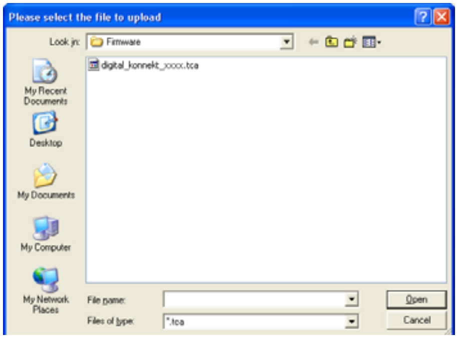
- Once the installer has been run (see above), the latest version of firmware is placed in the TC Near folder on your hard disk.
- You will now need to update the firmware for each Konnekt unit in the setup.
- Go to the “About page” for the unit you wish to update.

Example



- Press UPDATE FIRMWARE and you will be directed to the folder where the firmware is located.

Example



- Select the “xxx.bin” file with the highest number. This is the latest released firmware.
- Now press “Open” and wait while the firmware is being updated.

Reset to Default

The Reset to Default function will reset the selected Konnekt unit to factory default settings for the currently loaded software.

NOTE The software will not be degraded to previous software versions and no presets are affected.

TECHNICAL SPECIFICATIONS

Digital Inputs and Outputs	
Connector (AES):	XLR, 110 Ohm (176.4 kHz and 192 kHz on dual wire)
Formats (AES):	AES3-1992, AES11-2003
Connector (S/PDIF):	RCA Phono, 75 Ohm
Formats (S/PDIF and TosLink):	(176.4 kHz and 192 kHz on dual wire) S/PDIF (24 bit), IEC 60958, Pro-status bits
Connector (ADAT® or TosLink):	Optical Pipe
Format (ADAT®):	8-ch. @ 48 kHz, 8-ch. SMUX @ 96 kHz
Word Clock:	BNC, 75 Ohm, 1 x Fs, 2 Vpp terminated, rising edge reference
Firewire (format):	IEEE 1394a, S400, IEC 61883
Firewire (channels):	16 to and from the DAW
Digital IO Engine:	TC DICE II Technology, handling all IO formats

Clock and Jitter	
Internal Sample Rates:	44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz and 192 kHz
Internal Clock Precision:	+/- 30 PPM
External Sample Rates:	43 to 193 kHz, jitter rejection at all rates
Jitter Rejection Engine:	JET™ technology in TC DICE II
Jitter Rejection Filter:	< -3 dB @ 10 Hz, < -100 dB @ 600 Hz
DIO Interface Jitter:	< 1 ns peak, BW: 700 Hz to 100 kHz
Digital Output Phase (stand alone and across network):	< 0.5 % of sample period
Input Slip Sample Tolerance (all DIs):	+50 % to -50 % of sample period
Processing Delay DIO @ 192/96/48 kHz:	0.03/0.05/0.1 ms when synchronous
Frequency Response DIO:	24 bit direct through when synchronous

Sample Rate Converter (4 x 2 ch)	
THD:	< -125 dB (0.001%) @ 1 kHz, -1 dBFS
Dynamic Range:	< -128 dB(A), 20 Hz to 20 kHz
Freq. Response:	+0/-0.025 dB, 20 Hz to 23 kHz @ 48 kHz
Conversion Type:	28 bit linear phase filtering
Audio Delay:	2.70 ms @ 44.1 kHz to 96 kHz, 1.83 ms @ 96 kHz to 48 kHz
Input / Output Sampling Range:	30 - 100 kHz / 43 - 96 kHz

Line Outputs	
Connectors:	1/4" TRS Jack, balanced outputs
Impedance:	200 Ohm
Max Ouput Level:	+13 dBu @ 1 kHz, -1 dBFS
THD:	< -90 dB (0.003%) @ 1 kHz, -1 dBFS
Dynamic Range:	< -101 dB, 20 Hz to 20 kHz
Freq. Response:	+0/-0.25 dB, 20 Hz to 20 kHz < -95 dB,
Crosstalk:	20 Hz to 20 kHz

DAC	
D to A Conversion:	24 bit, 128 x oversampling bitstream 0.1/
D to A Delay @ 192/96/48 kHz:	0.2/0.4 ms

Headphones Output	
Connectors	1/4" TRS Jack (Stereo)
Impedance	32 Ohm
Max Output Level:	+12 dBu
THD:	< -80 dB (0.01%) @ 1 kHz, -1 dBFS
Dynamic Range:	< -101 dB, 20 Hz to 20 kHz
Freq. Response:	+0/-1 dB, 20 Hz to 20 kHz
Crosstalk:	< -85 dB, 20 Hz to 20 kHz
Power @ 32 Ohm Load:	60 mW

EMC	
Complies With:	EN 55103-1 and EN 55103-2, FCC part 15, Class B, CISPR 22, Class B

Safety	
Certified To:	IEC 60065, EN 60065, UL6500 and CSA E60065 CSA FILE #LR108093

Environment	
Operating Temperature:	32° F to 122° F (0° C to 50° C)
Storage Temperature:	-22° F to 167° F (-30° C to 70° C)
Humidity:	Max. 90 % non-condensing

Control Interface	
Firewire (DAW):	IEEE 1394a, IEC 61883

General	
Dimensions:	19" x 1.75" x 8.2" (483 x 44 x 195 mm)
Weight:	4.8 lb. (2.2 kg)
Finish:	Anodized aluminum front, Plated and painted steel chassis
Signal Activity Meter:	1 LED pr. stereo channel.
Power Supply	90 to 240 VAC, 50 to 60 Hz (auto select)
Firewire Bus Powered:	No
Power Consumption:	<15 W
Warranty Parts and labor:	1 year